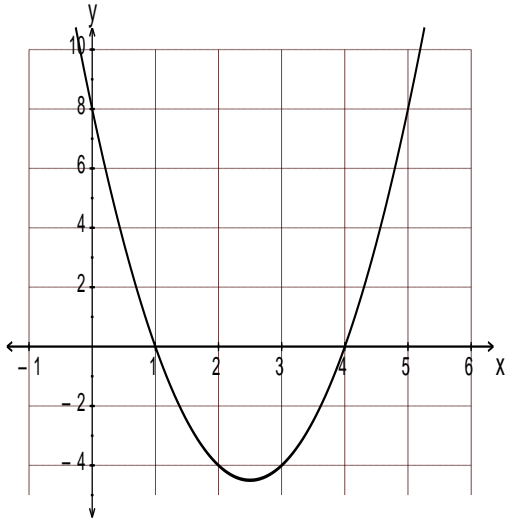


## National 5

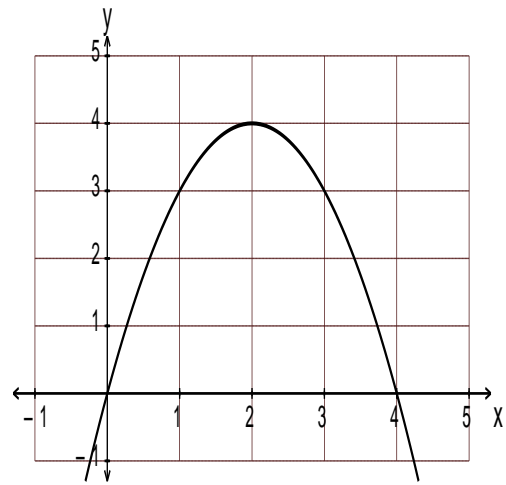
### Homework RE20

1. Establish the equation of each of these parabolas

(a)



(b)



2. Prove that:

(a)  $\sin^3 A + \sin A \cos^2 A = \sin A$ .

(b)  $\cos A \tan A = \sin A$ .

(c)  $\frac{1 - \cos^2 A}{\cos^2 A} = \tan^2 A$ .

3. Simplify:

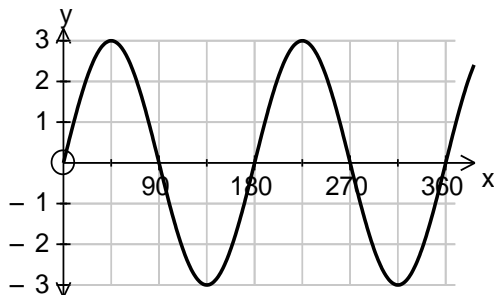
(a)  $\frac{3}{x} - \frac{2}{x^2}$

(b)  $\frac{1}{2y} - \frac{1}{3y}$

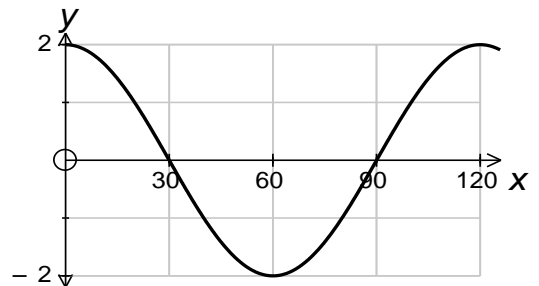
(c)  $\frac{5}{x} - \frac{2}{x-2}$

4. Find the equation of each of these Trig graphs:

(a)

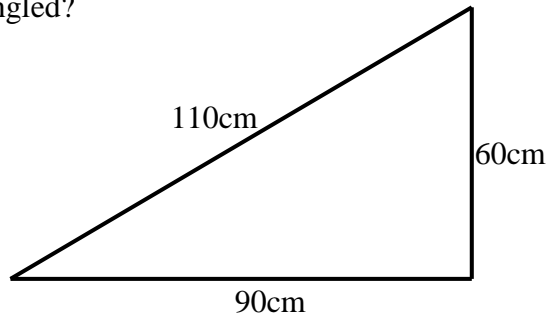


(b)

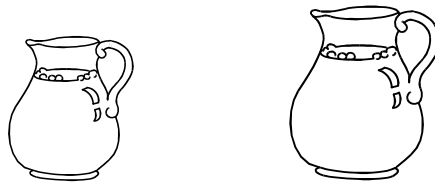


5. (a)  $d = \frac{k-m}{t}$ . Change the subject to  $k$ .
- (b)  $Q = p^2 + 3T$ . Change the subject to  $T$ .
- (c) (d)  $m = \frac{3x+2y}{p}$ . Change the subject to  $x$ .

6. Is the triangle below right-angled?



7. These two jugs are mathematically similar. The first has a diameter of 15cm and the second has a diameter of 20cm.  
If the first holds 2.16 litres of liquid, how many litres does the second hold?



8. There are 4 girls and 14 boys in a class.  
A child is chosen at random and is asked to roll a fair die, numbered from 1 to 6.  
Which of these is more likely?

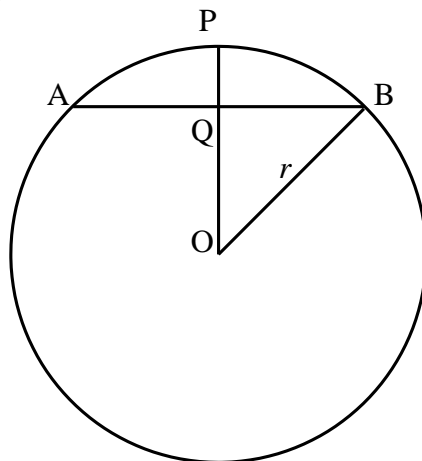
A: the child is female

**OR**

B: the child rolls a 5.

Justify your answer fully.

9. In the circle below, AB has length 12 units and PQ has length 2 units.  
O is the centre and the radius has length  $r$  units.  
Calculate the length of the radius.



10. Two variables  $x$  and  $y$  are connected by the relationship  $y = ax + b$ .  
Given that both  $a$  and  $b$  are negative, sketch a possible graph of  $y$  against  $x$  to illustrate this relationship.